935248 COMPLETE SPECIFICATION

3 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

Fig. 1.

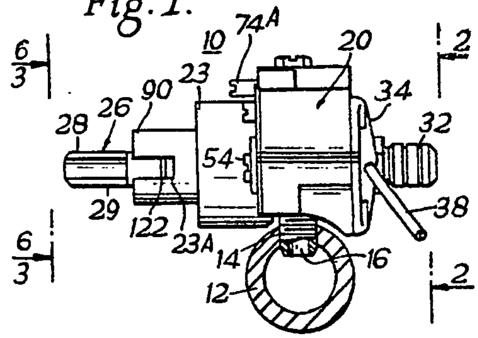


Fig. 2.

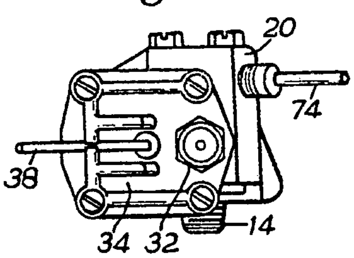


Fig. 3.

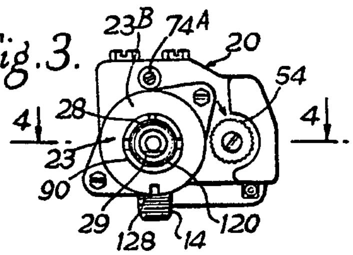


Fig. 4.

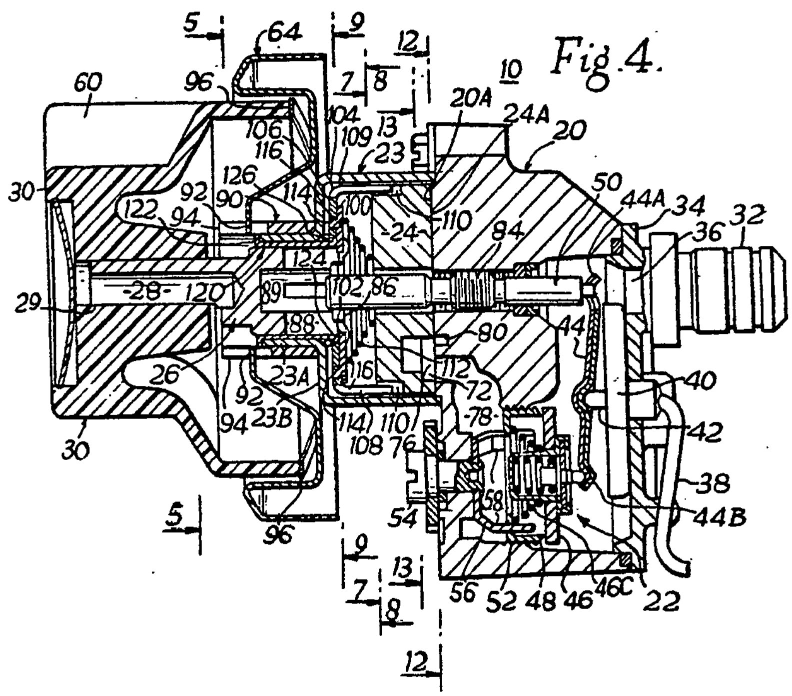


Fig.5.

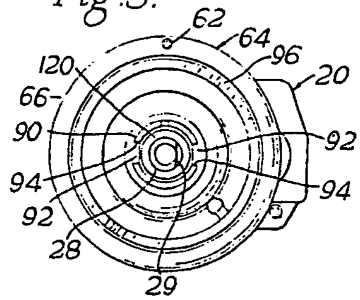


Fig.6.

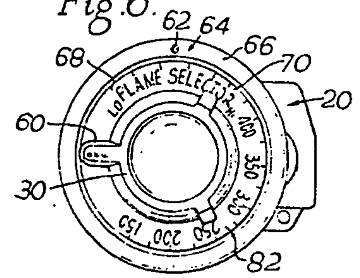


Fig.7.

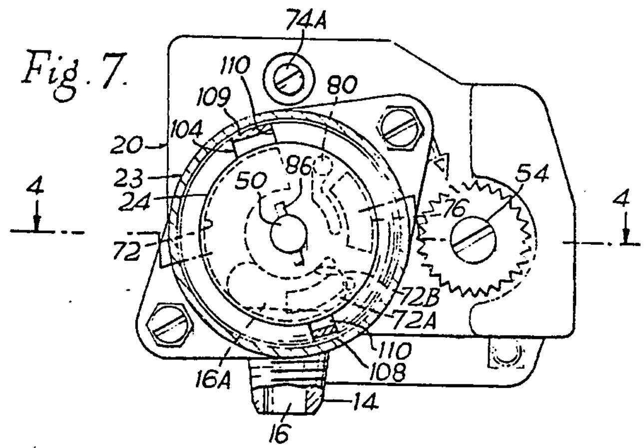


Fig.8.

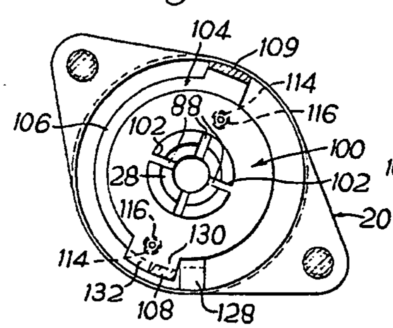
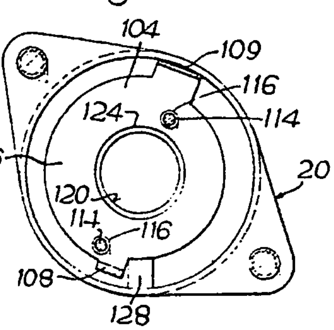


Fig.9.



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Sheets 2 & 3

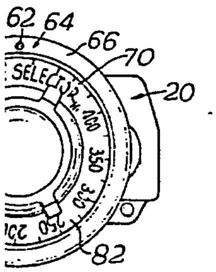


Fig. 10.

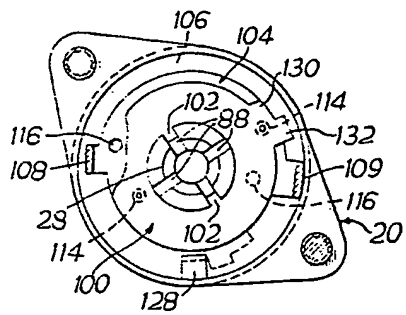
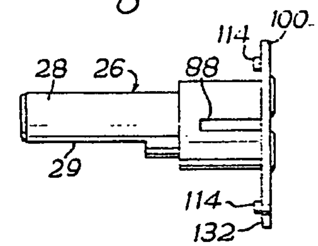


Fig. 11.



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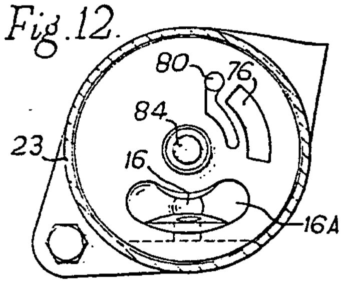

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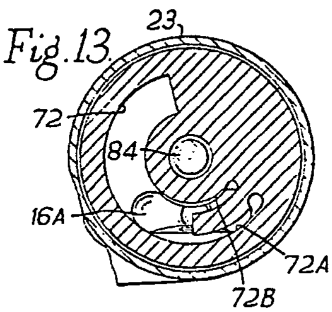


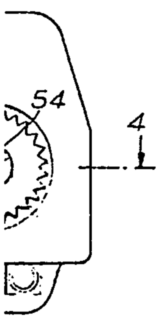
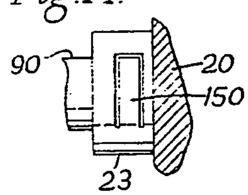


Fig. 14.



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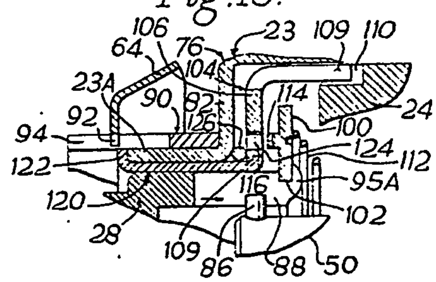

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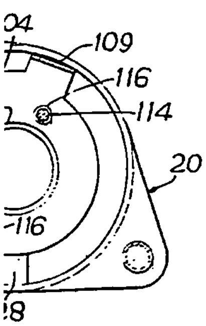
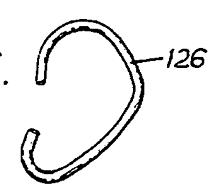


Fig. 16.



935248 COMPLETE SPECIFICATION

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Sheets 2 & 3

Fig. 5.

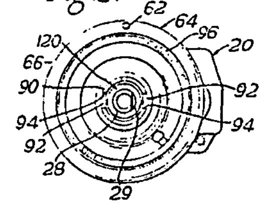
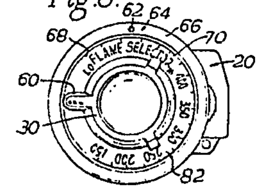


Fig. 6.



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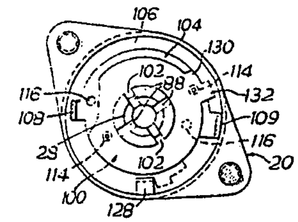

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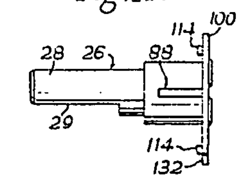


Fig. 7.

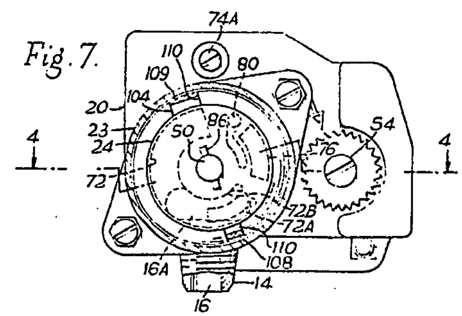
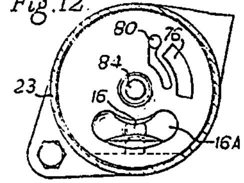


Fig. 12.



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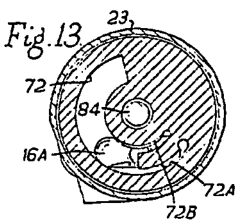


Fig. 14.

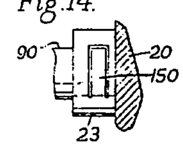


Fig. 15.

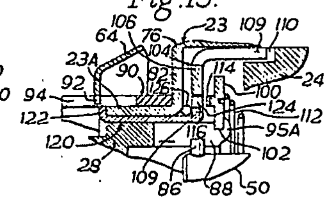


Fig. 8.

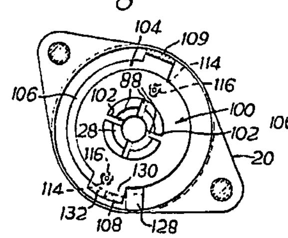


Fig. 9.

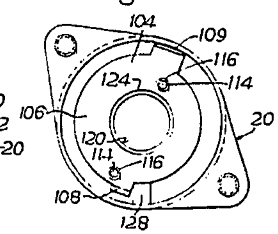
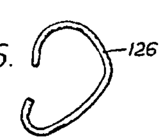


Fig. 16.



PATENT SPECIFICATION — 935,248

DRAWINGS ATTACHED.

935,248

Date of Application and filing Complete Specification: Dec. 31, 1959. No. 44441/59.

Application made in United States of America (No. 817,519) on June 2, 1959.

Complete Specification Published: Aug. 28, 1963.

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Index at Acceptance :—**Class 135**, VE3B2, VT4(A:B).

International Classification :—**F06k.**

COMPLETE SPECIFICATION.

Thermostatic Gas Valve.

We, HARPER-WYMAN COMPANY, a Corporation organized under the laws of the State of Illinois, United States of America, of 8550 Vincennes Avenue, Chicago, Illinois, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to gas valves and has for its primary object the provision of a new and improved thermostatic gas valve.

The present invention provides a thermostatic gas valve of the type including a rotatable gas flow controlling control element, a thermostatically actuated valve controlling the flow in series with the element, and means including manually operable means movable between an off position and a high flow position for operating the control element in a marked gas flow selection range of movement, and the operable means being movable over a marked temperature adjustment range of movement for adjusting in a predetermined manner the temperature to be maintained by the thermostatically actuated valve, the high temperature end of the marked temperature adjustment range being adjacent the high flow position of the marked gas flow selection range.

The present invention also provides a thermostatic gas valve of the type including a rotatable gas flow controlling control element and a thermostatically actuated valve controlling the flow in series with the element, the valve including manually operable means movable over a limited range of movement in a predetermined direction for operating said control element in a direction to increase gas flow and simultaneously lowering the temperature to be maintained by said thermostatically actuated valve.

Another object of the present invention is to provide an improved and simplified thermostatic gas valve including means whereby the user may select a desired height of flame which is then thermostatically controlled in order to maintain a desired temperature in the controlled device, such as a cooking vessel placed above a top burner.

A still further object of the invention is to provide a thermostatic gas valve with new and improved valve element operating means co-operatively associated with thermostatic control means whereby a simplified single control for the valve element and thermostatic means are provided to enable the thermostatic control means to control the supply of gas flowing through the valve irrespective of the position of the valve element and the selected height of flame.

Another object of the present invention is to provide a new and improved thermostatic valve with flame selector means so constructed and arranged in which the porting and thermostatic control are so constructed and arranged that the flame selection is effectively made in a first or gas flow selection range of movement from off and the temperature selection in a second or temperature adjustment range effectively beyond the first or gas flow selection range and the temperature selection is in a decreasing direction from high temperature.

Another object of the present invention is to provide a new and improved thermosatic valve having a single manually operable means for rotating a gas flow controlling valve element and setting the temperature of an associated thermostatically controlled valve including disengageable clutch means provided between the valve element

and manually operable means and having also braking means minimizing movement of the valve element after declutching and during subsequent operation of the manually operable means to adjust the temperature setting.

In brief, the valve of the present invention comprises a manually operable valve movable between off and full on positions and operable to various positions between these limit positions to determine the rate of flow of gas to a burner. Different settings of the valve will thus provide different flame heights at the burner. The valve includes also a thermostatically controlled valve regulating the thus selected gas flow to the burner, thereby to maintain a desired temperature as of a cooking vessel placed above the burner. The rotary valve element and thermostatic means are controlled as by a single handle and a stem assembly rotatable thereby. The stem assembly is both rotatable and axially movable. It is permanently connected to the thermostatic control means but is adapted selectively to be connected to or disengaged from the rotary valve element. This enables the handle to be moved to operate the rotatable valve element to provide a desired flame height. Thereafter the handle can be disengaged from the rotatable valve element actuating means and further rotated to select a desired temperature to be maintained by the thermostatic valve. The arrangement is such that the handle can be disengaged from the rotary valve element actuating means when desired. When so disengaged, movement of the valve element upon subsequent movement of the handle for temperature adjustment purposes is minimized by frictional braking means. It is also such that when it is desired to shut off the flow of gas as by turning the handle to off position, the rotary valve disc is re-engaged and can be moved to its off position. The valve porting is so arranged that as the valve handle is moved in a first or gas flow selection range of movement from off toward full on or high a greater flow of gas is effected. Continued movement of the valve handle in a second or temperature adjustment range of movement beyond the first or gas flow selection range in the same direction results in lowering of the temperature to be maintained. As a result, the valve can be set for a low flame which is not normally thermostatically controlled because the low flame will generally not produce sufficient heat to raise the temperature of the cooking vessel to the high temperature, except under abnormal conditions.

Other objects and advantages of the present invention will become apparent from the ensuing description of an illustrative embodiment thereof, in the course of which reference is had to the accompanying drawings, in which:—

Figure 1 is a side elevational view of a valve constructed in accordance with the present invention in an intermediate on position and with the valve and thermostat actuating handle omitted;

Figure 2 is an end elevational view looking in the direction of the line 2—2 of Figure 1;

Figure 3 is a front elevational view taken along th line 6—6 of Figure 1, but illustrating the valve in its off position

Figure 4 is an enlarged axial horizontal cross section view taken along the line 4—4 of Figure 3 and 4—4 of Figure 7 and showing the valve in an intermediate on position;

Figure 5 is an end elevational view taken along line 5—5 of Figure 4, but with the handle omitted;

Figure 6 is a front elevational view of the valve of Figure 1 looking in the direction of line 3—3 of that figure and showing the handle, which is not shown in Figure 1, in an intermediate on position;

Figure 7 is a transverse cross sectional view taken along the line 7—7 of Figure 4 but with the valve in its off position;

Figure 8 is a similar cross sectional view taken along line 8—8 of Figure 4 with the valve in its off position, but with the rotor valve housing omitted;

Figure 9 is a transverse cross sectional view taken along line 9—9 of Figure 4 with the valve in its off position and with the valve stem assembly omitted;

Figure 10 is a view similar to Figure 8, partly broken away, corresponding to a different position of the valve, one that is an intermediate position of the flame selector and an intermediate temperature setting;

Figure 11 is an enlarged plan view of a stem assembly utilized in the valve;

Figure 12 is a view on a reduced scale along line 12—12 of Figure 4 illustrating the porting on the valve body;

Figure 13 is a view along the line 13—13 of Figure 4 illustrating the porting on the rotatable valve member in its off position;

Figure 14 is a fragmentary view showing a modified form of braking means provided to minimize movement of the rotatable flow control element after the operating means has been declutched from it and is connected to the temperature adjusting means;

Figure 15 is a fragmentary cross sectional view illustrating the embodiment of Figures 1 to 13 with the clutch disengaged; and

Figure 16 is a perspective view of the spring utilized to provide the frictional holding in the embodiment of Figures 1 to 13.

Referring now to the drawings, and first to Figures 1 to 6, the valve of the present invention is indicated as a whole by reference character 10. It is adapted to be

mounted upon and to be supplied with gas from a gas supply manifold 12, the mounting being effected by an externally threaded dependent nipple 14 within which is a gas inlet passageway 16 having a horizontal branch with an arcuate opening 16A on the front face 20A of the valve body 20 (see Figures 7 and 12). The valve includes, in the main, the body portion 20 within which is mounted thermostatically actuated control means 22, which will be described hereinafter. The front of the body has attached to it a housing or casing 23, within which is mounted a rotary valve element 24, see Figure 4, adapted to be actuated through a stem assembly 26 including a stem 28 having a flat 29 at its outer end to which is attached an operating handle 30, the flat facing down, as shown in Figure 3, in the off position of the valve. The handle 30 is rotatable to select a desired height of flame by rotating the valve element 24 to a desired position. The handle is also rotatable independently of the rotation of the valve element in order to predetermine the temperature of a cooking vessel to be maintained by the control with the selected height of flame.

Gas from the valve is discharged through an outlet hood or nozzle 32 attached to a closure plate 34 which is apertured to provide an outlet passageway 36. The gas discharged from the nozzle 32 is supplied in conventional manner, as through a venturi to a burner, not shown. Associated with the burner is a temperature sensing unit, also not shown, adapted to engage the bottime of a cooking vessel placed over the burner. The sensing element is connected as through a capillary tube 38 to an axially expansible actuating or power element 40 forming part of the thermostatic control means 22 and provided with a projection 42 which is moved transversely, see Figure 4, to shift the position of a valve controlling lever 44, end 44B of which is connected to a regulating valve 46 movable against bias spring 46C relative to a valve seat 48 and the other end 44A of which is connected to an axially movable element 50 adapted to be manually adjusted axially of its length through the handle 30 and the stem assembly 26 for temperature selection. The lever 44 is made of bimetallic material to provide ambient temperature compensation.

Calibration of the thermostatic control is effected by adjustment of the axial portion of the valve seat 48 formed at the end of tubular externally threaded element 52. This adjustment is effected by rotary control element 54 accessible from the exterior of the valve and connected to tubular element 52 by a forked coupling element 56 having spaced apart axially extending driving portions 58.

The desired height of flame may be selected through rotation of the valve handle 30 and the temperature to be maintained by the thermostatically actuated valve 46 is also selected by rotation of the valve handle 30 to a desired angular position. Referring first to Figure 6, it may be noted that the handle is provided with a radial boss 60 marked "off" which is shown in a generally horizontal position, but which in the off position of the valve is in an upper vertical position and underneath an off position indicating dot 62 on an associated bezel 64 (see also Figure 4) having an outer rim portion 66 surrounding the handle.

For flame selection the valve handle is turned counterclockwise from the off position to some intermediate position such as that illustrated in Figure 6, in which position an intermediate height of flame is obtained, the position of the dot 62 relative to the valve handle being between a low flame position marking 68 and a high flame, full on position marking 70 on the handle. Referring now to Figures 7, 12 and 13, it will be noted that a relatively large arcuate recess 72 is provided in the rotor disc 24 at its face 24A abutting against the face 20A of the valve body. The recess 72 has a first relatively narrow arcuate extension 72A which is provided for supplying the lower quantities of gas to the burner for low flame selection. A second narrow arcuate recess of uniform depth 72B is provided for supplying gas through a conduit 74 (see Figure 2) at a rate determined by an adjustable screw 74A (see Figures 3 and 7) as to a lighting tower (not shown), associated with a burner (not shown) through an outlet port 80 on the face 20A of the valve and suitably connected to a tower outlet passageway on the valve body (not shown), see Figure 2.

The flow to the main burner is through a passageway 76 at the face 20A of the valve body 20, it communicating with an outlet chamber 78 in which the valve seat element 52 is located. The passageway 72A is tapered along its length to provide a gradual change in gas flow as the valve disc is rotated in a counterclockwise direction from off toward full on. If desired, the lighting tower may be eliminated and the passageway 78 may be connected to bypass the regulating valve 46 to supply a minimum quantity of gas to outlet passageway 36 whenever the valve is turned off.

For flame selection, the valve handle and rotor disc 24 are turned in a counterclockwise direction from off position toward full on. In off position, the passageways 76 and 80 are both closed by the overlying face 24A of the valve disc. As the disc is rotated in a counterclockwise direction, the arcuate extension pasageways 72A and 72B come into initial registry with passageways

76 and 80, thereby supplying a low quantity of gas to the outlet hood 32 through the thermostatic valve 22 and to the lighting tower through port 80 and associated passageways, not shown. Continued movement in a counterclockwise direction gradually increases the flow of gas to the outlet 32 through passageway 76 and the thermostatic valve until full registry is effected between passageways 72 and 76, as at the "Hi" indication 70 on the valve handle.

One of the important features of the present invention resides in the flame selection and its correlation to the thermostatic control. The handle 30 is movable and operable in a first or gas flow selection range of movement (corresponding to the positioning of dot 62 between "Lo" and "Hi") to turn the control element 24 for gas flow selection. On further movement, the handle 30 is operable over a second or temperature adjustment range of movement (corresponding to the position of dot 62 between 400 and 150) for adjusting in predetermined manner the temperature to be maintained by the thermostatically actuated valve 22. The high temperature end (400) of the second or temperature adjustment range (400 to 150) marked on the handle is adjacent the high flame position of the first gas flow selection range, as shown in Figure 6. The arrangement is achieved by constructing the thermostatic valve regulating shaft 50 with the thread 84 properly orientated with the valve handle so that this mode of operation is effected. A result of it is that the lower the flame that is selected, the higher the temperature to be maintained. This means, effectively, that the valve acts as a manual valve at the low temperature settings because the gas supplied to the burner is not sufficient to heat the contents of a cooking vessel to a high temperature required for shutting off the flow of gas by the thermostatic valve 22. However, should the contents of the cooking vessel boil away and an abnormally high temperature be reached, the thermostatic valve will shut off the flow of gas to the burner.

As already indicated the handle 30 is also rotatable to select the temperature to be maintained by the valve, between 400 and 150 as indicated by the indicia 82 on the valve handle, which indicia 82 co-operates with the dot 62 on the bezel. The temperature setting is effected by changing the fulcrum point of the lever 44 operatively connected between the valve 46 and the axially movable regulating element 50. One end of the latter is connected as to the forked end 44A of the lever 44, see Figure 4. An intermediate portion of element 50 is externally threaded as indicated by the reference character 84 so that rotation of the element 50 effects its axial movement thereby to adjust the fulcrum point of the lever 44. The lever or shaft 50 is connected to the rotary valve stem as by a pin and slot connection comprising a pin 86 at the outer end of shaft 50 engageable in slots 88 at the inner end of the stem 28 which is provided with a bore 89 in order to permit relative axial movement between the stem and temperature regulating shaft 50.

The bezel 64 is slidably mounted upon a bezel mounting tube 90 fixedly mounted on a smaller diameter forwardly extending tubular portion 23A of the housing 23. The bezel is properly located and prevented from rotating relative to the valve by a tongue and slot construction consisting of the angularly spaced apart tongues 92 on the bezel 64 and the slots 94 on the mounting tube 90. The bezel is biased rearwardly by a concave-convex spring 96.

The flame and temperature selection mechanism of the present invention includes a novel drive between the valve stem and the valve disc. This drive includes a drive washer 100 staked or otherwise fixedly secured to the inner end of the valve stem 28 and having a tongue and slot connection relative thereto provided by axial slots 88 (of which there are four) and the washer tongues 102 (see Figure 4) extending a short distance into the slots, thereby effectively to couple the drive washer and stem together. The drive washer 100 is adapted selectively to be coupled to the rotary valve disc 24 through a drive yoke 104 having a circular disc-like portion 106 and a pair of axially extending drive fingers 108 and 109 engaged in external peripheral recesses 110 on the valve disc. The stem assembly including the drive washer 100 is axially movable against the bias of a spring 112 disposed in the casing 23 between the valve disc 24 and the drive washer 100. The arrangement is thus such that the spring holds the valve disc in engagement with the valve body and biases the drive washer 100 against the central circular portion 106 of the drive yoke.

In the position indicated in Figure 4, the drive washer 100 is in driving relation with the yoke 104, this relation being provided by two opposed forwardly extending drive projections 114 on the washer extending into the two recesses or openings in the central portion 106 of the drive yoke 104. Thus, as long as the parts are in the relation shown in Figure 4, the valve handle and stem are coupled to the valve disc 24. To uncouple them, the valve handle 30 is moved inwardly thereby to move the drive washer 100 axially inwardly against the force of the spring 112, thereby to disengage the drive fingers 114 from the openings 116. Thereafter, the stem assembly can be turned to rotate the drive disc so as to

move the fingers 114 out of registry with the drive yoke, the drive yoke being held stationary by friction exerted upon it in a manner to be described shortly.

When the drive disc is uncoupled from the drive yoke, rotation of the valve handle does not turn the rotary valve disc 24 but the thermostatic regulating means is operated through the axially extending shaft 50 which, as heretofore described, changes the fulcrum point of the lever 44.

Undesired rotation of the rotary valve disc 24 when the stem assembly is uncoupled therefrom is prevented by friction braking means which may take various forms of which one form is shown in Figures 1 to 13, 15 and 16 and another Figure 14. In brief, it includes a tubular sleeve 120 surrounding the inner portion of the valve stem 28 and constituting a bearing rotatably supporting the stem assembly. The sleeve 120 is fixedly secured to an axial forwardly extending flange portion 23A of the casing. Sleeve 120 has at its forward end a peripheral outwardly extending flange 122 abutting against the front end of the portion 23A of the casing. It has a second flange 124 at its inner end spaced some distance inwardly from the transverse portion 23B of the casing 23 and abutting against a counterbore at the inner region of the central portion 106 of the drive coupling or yoke and supporting the drive coupling 106 for rotation therearound. The portion 106 of the drive yoke is spaced somewhat from the casing and into this space is placed a concave-convex ring 126 bearing against the portion 106 and the interior of the casing, thereby to apply a frictional force against the drive yoke preventing it from being rotated by frictional forces imparted to it from the stem assembly after the stem assembly has been uncoupled therefrom.

The braking arrangement of Figure 14 is of a somewhat different form, particularly in that the braking means acts directly on the rotor disc element 24. As illustrated, the braking is provided by a plurality of tongues or fingers 150 formed integrally by portions of the casing 23 and which are bent inwardly frictionally to engage the periphery of the disc. While only one tongue is shown in Figure 14, a plurality, such as two diametrically opposed or three evenly spaced tongues, should be used to provide balanced forces on the disc.

The driving arrangement between the valve stem assembly and the disc drive yoke is such that the two can be uncoupled at any desired position of the rotary valve disc thereby to enable the height of the flame to be adjusted as desired. The valve disc is movable substantially 135 degrees between its off and full on positions. These positions are indicated and determined by engagement of one or the other of the drive fingers 108 and 109 with an indented projection 128 of the casing. The off position is determined by engagement of projection 108 with the projection 128 as shown in Figure 8. The full on position is determined by engagement of the abutment 109 with the opposite side of projection 128. The drive washer is also provided with an abutment 130 for substantially engaging the projection 128 in the off position. Immediately adjacent the abutment 130 is a somewhat longer radially extending abutment 132 engageable with the drive fingers 108 in order to insure return of the valve disc from any open position to its closed position as the handle is returned to its off position. Thus, even though the projections 114 on the drive washer 100 are not in the openings 116 of the drive yoke 104, as might be the case if the drive handle 30 is depressed inwardly, rotation of the handle to its off position will return the valve disc 30 to its off position.

In operation, the valve disc will normally be in its off position. In order to supply gas to a burner, the valve handle is turned counterclockwise from its off position to select a desired height of flame. As indicated in Figure 6, some intermediate height of flame may be selected. During this time the handle 30 remains axially in the position of Figure 4, to which it and the stem assembly are biased by the spring 112, thereby to couple the valve stem to valve disc 24. As shown, the stem assembly, including the drive washer 100, are drivingly connected to the rotary disc valve 24 through the yoke 104 by means of the drive finger 114 in the drive disc and apertures 116 in the yoke. After the desired flame height has been selected, the handle 30 is moved inwardly thereby to uncouple the drive disc from the drive yoke. Thereafter, the handle is turned further in a counterclockwise direction to select the temperature to be maintained, as shown in Figure 10. During operation, the temperature setting may be varied in either direction simply by rotating the valve handle. When it is desired to turn the valve off, the handle 30 is moved in a clockwise direction. When the temperature setting is varied, the valve disc is prevented from rotation by the friction of braking applied thereto through the spring 126.

When it is desired to return the valve to its off position, the handle is turned in a clockwise direction. In the event that the handle is not prevented from moving axially outwardly, the drive projection 114 will enter the openings 116 when the valve stem 28 moves to a position to align the fingers with the openings. At this time the spring 112 moves the stem assembly to re-

couple the stem assembly to the drive yoke. However, should the user prevent the handle from being moved outwardly by the spring 112, the projection 132 on the drive disc 106 will engage the drive yoke to insure return of the drive yoke and the valve disc to the off position.

As previously noted, the porting in the valve body and rotary disc are such that there is effectively provided a first range of movement of the handle and valve disc in which the size of flame may be selected. This is followed effectively by a second range of movement wherein the temperature to be maintained is selected. The arrangement, furthermore, is such that the high end of the temperature scale is adjacent the full on or high end of the flame selection range. This simplifies construction and operation and reduces the required amount of rotation of the valve handle and disc and also insures that for low flame settings the thermostatic control will be operative to control flow of gas only under abnormal conditions encountered as when the contents of a cooking vessel boil away. Perhaps it should be mentioned that the valve handle is connected to the thermostat adjusting means at all times but that the temperature adjustment at the low flame settings is so high that the thermostatic means is not normally operative. The result is the effective two range operation mentioned.

While the present invention has been described in connection with the details of illustrated embodiments thereof, these details are not intended to be limited to the illustrated embodiments except as set forth in the accompanying claims.

WHAT WE CLAIM IS:—

1. A thermostatic gas valve of the type including a rotatable gas flow controlling control element, a thermostatically actuated valve controlling the flow in series with the element, and means including manually operable means movable between an off position and a high flow position for operating the control element in a marked gas flow selection range of movement, and the operable means being movable over a marked temperature adjustment range of movement for adjusting in a predetermined manner the temperature to be maintained by the thermostatically actuated valve, the high temperature end of the marked temperature adjustment range being adjacent the high flow position of the marked gas flow selection range.

2. A thermostatic gas valve of the type including a rotatable gas flow controlling control element and a thermostatically actuated valve controlling the flow in series with the element, the valve including manually operable means movable over a limited range of movement in a predetermined direction for operating said control element in a direction to increase gas flow and simultaneously lowering the temperature to be maintained by said thermostatically actuated valve.

3. A thermostatic gas valve of the type including a rotatable control valve element, a thermostatically actuated valve controlling the flow in series with the element, a housing around said element and having an aperture located coaxially of the element and a valve stem extending into said housing through said aperture and rotatably and axially movable therein, said valve stem effecting rotation of said valve element and adjustment of the thermostatically actuated valve, the valve including a drive washer connected to said stem inside said housing, a drive yoke drivingly connected to said control element and having a central portion, said stem being axially and rotatably movable relative to said central portion, and normally engaged drive means on said drive washer and central portion of said yoke constituting clutch means adapted to be disengaged upon axial movement of said stem.

4. A thermostatic gas valve as claimed in Claim 1, 2 or 3 including disengageable clutch means interconnecting said manually operable means and control element.

5. A thermostatic gas valve as claimed in Claim 4 in which the clutch means includes a drive washer connected to the manually operable means, the drive yoke has axially projecting finger means drivingly connected to said element, normally engaged drive means are provided on said drive washer and the central portion of the yoke, which drive means is adapted to be disengaged upon axial movement of said manually operable means.

6. A gas valve as claimed in any of the preceding claims including means for preventing movement of said control element beyond the full on position.

7. A gas valve as claimed in Claim 6, wherein the means for preventing movement of the rotor valve disc is constituted by detent means on the housing.

8. A gas valve as claimed in any of the preceding claims including means associated with said manually operable means for returning said control element toward its off position independently of said clutch means.

9. A gas valve as claimed in Claim 8, wherein said means for returning said control element toward its off position independently of the clutch means includes means on the drive washer.

10. A gas valve as claimed in any of Claims 1, 2 and 4 to 9, inclusive, including friction means for minimizing movement of the control element by adjustment of the

temperature adjusting means when the clutch means is disengaged.

11. A gas valve as claimed in Claim 10, wherein said friction means acts on a peripheral portion of the control element.

12. A gas valve as claimed in Claim 10, wherein said friction means includes opposed tongue like portions of the valve housing bearing on a peripheral portion of the control element.

13. A gas valve as claimed in Claims 5 to 10, wherein said friction means acts on a portion of the drive yoke.

14. A gas valve as claimed in Claim 13, characterized in that said friction means and the drive yoke are mounted on the valve housing.

15. A gas valve as claimed in Claim 13, characterized by the fact that the drive yoke, friction means and housing comprises a unitary assembly.

16. A gas valve as claimed in Claims 14 and 15, characterized by the fact that the housing has a tubular portion, a tubular sleeve is mounted on said tubular portion, a shaft is connected to the said manually operable means and is mounted for rotary and axial movement in said sleeve, and said friction means comprises a spring around the exterior of the tube between the housing and drive yoke and exerts an axially directed frictional force on the yoke.

17. A gas valve constructed and arranged substantially as hereinbefore described with reference to the accompanying drawings.

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